

## System of Equations: Coins

Marcus has a pocket full of 17 nickels and dimes. If the total value of the change is \$1.35 how many nickels and how many dimes make up the collection.

What do you know about the problem?

What do about coins?

	# of coins	Coin Value (\$ per coin)	Total Value
Nickels	x	\$0.05	0.05x
Dimes	y	\$0.10	0.10y
Total	17		1.35

$$\begin{aligned}x + y &= 17 \\ 0.05x + 0.10y &= 1.35\end{aligned}$$

$$\begin{aligned}x + y &= 17 \\ 100 \cdot (0.05x + 0.10y) &= 100 \cdot 1.35\end{aligned}$$

$$\begin{aligned}x + y &= 17 \\ 5x + 10y &= 135\end{aligned}$$

$$\begin{aligned}x + y &= 17 \\ \frac{1}{5} \cdot (5x + 10y) &= \frac{1}{5} \cdot (135)\end{aligned}$$

$$\begin{aligned}x + y &= 17 \\ x + 2y &= 27 \\ \hline -y &= -10 \\ y &= 10\end{aligned}$$

$$\begin{aligned}x + y &= 17 \\ x + 10 &= 17 \\ \hline -10 & -10 \\ \hline x &= 7\end{aligned}$$

There are 7 nickels and 10 dimes.

Check:

$$\begin{aligned}0.05x + 0.10y &= 1.35 \\ 0.05(7) + 0.10(10) &= 1.35 \\ 0.35 + 1.00 &= 1.35 \\ 1.35 &= 1.35 \quad \text{TRUE}\end{aligned}$$